

Task	NBACK (v211129)
Duration (s)	284 (plus 10s of reference scans for multi echo, as ‘Stay very still’ screen shown)
Volume #	284 (12 T1 stabilization)
TR (s)	1.00
Stimuli	<p>FACES from HCP</p> <p>SCENES from Konkle Lab ‘Massive Memory’ Scene Image Set (especially images used in scene ‘localizer’ within Josephs & Konkle 2020 <i>PNAS</i>)</p> <p>LETTERS: 60pt Ariel font consonants (from 430, uppercase: B, C, D, F, G, H, J, K, L, M, N, P, Q, R, S, T, V, Z)</p> <p>RHYMES: 16 10-word lists: all words are 1-syllable; lists are matched for length [4-6 letters, mean = 4.7 for all lists] and frequency [mean = 44.08, range = 0.23 across lists] using the Corpus of Contemporary American English (Davies, 2008), vDecember 2015.]</p>
Task requirements	<p>Participants are instructed to fixate a central, white crosshair for the entire run.</p> <ul style="list-style-type: none"> - During 2-back blocks, participants press the right index finger key to indicate a match with the stimulus 2 trials back, or the left index finger key for a non-match. - During 0-back blocks, participants press the right index finger key to indicate a match with the first (cued) stimulus and the left index finger key for a non-match. - For images and letters, “match” = identical; for rhymes, “match” = rhyming words.
Other task notes	At the beginning of each block, a cue indicates 2-back or 0-back.
# of runs	8
Run creation	<p>Each run features 8 blocks (1 0-back and 1 2-back block per category per run). Each block features a cue and 9 trials, including 2 target (“match”) trials and 2 lures (repeated non-targets).</p> <p>Target orders are balanced across 0-back and 2-back blocks across the 4 categories. Targets are equally likely to appear in each position (T2-T9) across and within each run.</p> <p>Lure orders vary (e.g., are not identical within blocks with matching target orders across categories), but lures appear in each position (T2-T9) 16 times each across all runs.</p> <p>Category orders are not repeated across runs, and no categories appear (i.e., as 0-back and 2-back) back-to-back. All four categories are seen before a category is repeated. 0-Back and 2-Back blocks, for each category, appear in each block position (1-8) once across runs (see “Detailed Order” below.)</p>
Possibility of more runs	Would need more stimuli
Design	<p>Each run includes 8 blocks (one per cue-type per category). Each block includes a cue and 9 trials (25s total). 4 fixation periods (15s each) occur throughout a run (after every 2 stimulus blocks). Within a block, between each stimulus, the crosshair is green. During longer fixation periods (15s), the crosshair is white. All stimuli are shown on a black background. Text (for rhymes and letters) is white.</p> <p><u>NBACK1</u> [12s (+)] : 12s (+), 25s(2-Back RHYMES), 25s(0-Back LETTERS) 15s (+), 25s(2-Back FACES), 25s(0-Back SCENES) 15s (+), 25s(2-Back LETTERS), 25s(2-Back SCENES) 15s (+), 25s(0-Back FACES), 25s(0-Back RHYMES) 15s (+)</p>

NBACK2

[12s (+)] : 12s (+), 25s(0-Back FACES), 25s(0-Back RHYMES) 15s (+), 25s(2-Back SCENES), 25s(2-Back LETTERS) 15s (+), 25s(2-Back RHYMES), 25s(0-Back SCENES) 15s (+), 25s(2-Back FACES), 25s(0-Back LETTERS) 15s (+)

NBACK3

[12s (+)] : 12s (+), 25s(0-Back LETTERS), 25s(2-Back SCENES) 15s (+), 25s(2-Back RHYMES), 25s(0-Back FACES) 15s (+), 25s(0-Back SCENES), 25s(0-Back RHYMES) 15s (+), 25s(2-Back LETTERS), 25s(2-Back FACES) 15s (+)

NBACK4

[12s (+)] : 12s (+), 25s(2-Back SCENES), 25s(0-Back FACES) 15s (+), 25s(2-Back LETTERS), 25s(0-Back RHYMES) 15s (+), 25s(0-Back LETTERS), 25s(2-Back FACES) 15s (+), 25s(0-Back SCENES), 25s(2-Back RHYMES) 15s (+)

NBACK5

[12s (+)] : 12s (+), 25s(0-Back RHYMES), 25s(2-Back FACES) 15s (+), 25s(0-Back SCENES), 25s(0-Back LETTERS) 15s (+), 25s(2-Back SCENES), 25s(2-Back LETTERS) 15s (+), 25s(2-Back RHYMES), 25s(0-Back FACES) 15s (+)

NBACK6

[12s (+)] : 12s (+), 25s(0-Back SCENES), 25s(2-Back RHYMES) 15s (+), 25s(0-Back LETTERS), 25s(2-Back FACES) 15s (+), 25s(0-Back RHYMES), 25s(0-Back FACES) 15s (+), 25s(2-Back SCENES), 25s(2-Back LETTERS) 15s (+)

NBACK7

[12s (+)] : 12s (+), 25s(2-Back FACES), 25s(2-Back LETTERS) 15s (+), 25s(0-Back RHYMES), 25s(2-Back SCENES) 15s (+), 25s(0-Back FACES), 25s(2-Back RHYMES) 15s (+), 25s(0-Back LETTERS), 25s(0-Back SCENES) 15s (+)

NBACK8

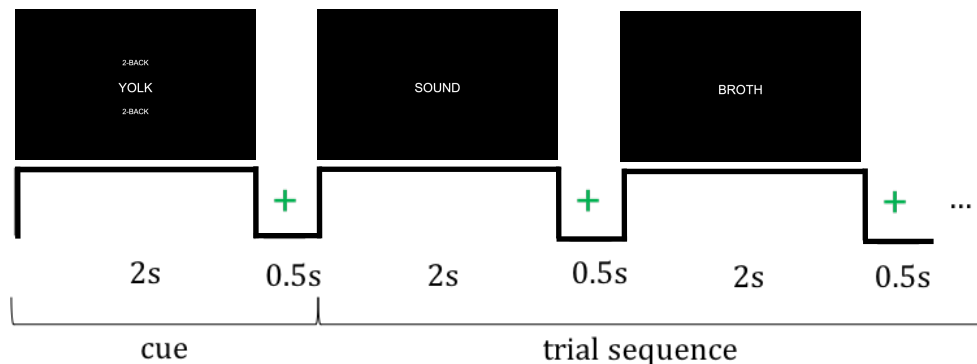
[12s (+)] : 12s (+), 25s(2-Back LETTERS), 25s(0-Back SCENES) 15s (+), 25s(0-Back FACES), 25s(2-Back RHYMES) 15s (+), 25s(2-Back FACES), 25s(0-Back LETTERS) 15s (+), 25s(0-Back RHYMES), 25s(2-Back SCENES) 15s (+)

Trials/Block/Run

80 stimuli per run, 10 in each block: 40 2-back and 40 0-back, 20 per category

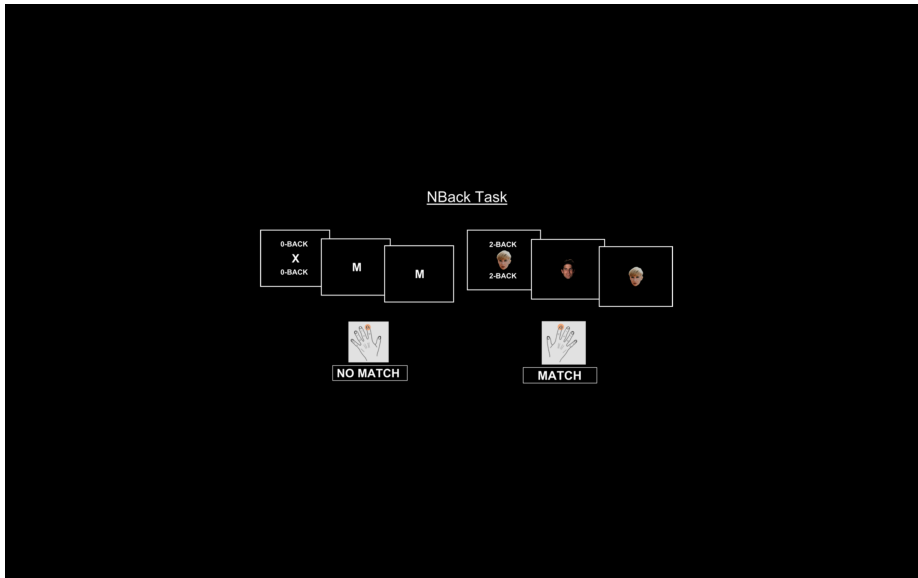
Trial timing

Within a block: each stimulus (including cue) is shown for 2s, followed by 0.5s fixation.



Randomization	<p>Not including cues, targets are equally likely to occur in T2-T9 across blocks. All blocks feature 2 targets and 2 lures. Lures are equally likely to occur across T2-T9 when considering all runs (but differ across blocks, including those matched by category target-wise). 4 runs start with 2-back (1 per category) and 4 with 0-back (1 per category).</p> <p>Here, 2-Back blocks are in the darker shade and 0-Back blocks the lighter shade of each category-specific color:</p> <table border="1"> <thead> <tr> <th></th> <th>BLOCK1</th> <th>BLOCK2</th> <th>BLOCK3</th> <th>BLOCK4</th> <th>BLOCK5</th> <th>BLOCK6</th> <th>BLOCK7</th> <th>BLOCK8</th> </tr> </thead> <tbody> <tr> <td>NBACK1</td> <td>RHYMES-2</td> <td>LETTERS-0</td> <td>FACES-2</td> <td>SCENES-0</td> <td>LETTERS-2</td> <td>SCENES-2</td> <td>FACES-0</td> <td>RHYMES-0</td> </tr> <tr> <td>NBACK2</td> <td>FACES-0</td> <td>RHYMES-0</td> <td>SCENES-2</td> <td>LETTERS-2</td> <td>RHYMES-2</td> <td>SCENES-0</td> <td>FACES-2</td> <td>LETTERS-0</td> </tr> <tr> <td>NBACK3</td> <td>LETTERS-0</td> <td>SCENES-2</td> <td>RHYMES-2</td> <td>FACES-0</td> <td>SCENES-0</td> <td>RHYMES-0</td> <td>LETTERS-2</td> <td>FACES-2</td> </tr> <tr> <td>NBACK4</td> <td>SCENES-2</td> <td>FACES-0</td> <td>LETTERS-2</td> <td>RHYMES-0</td> <td>LETTERS-0</td> <td>FACES-2</td> <td>SCENES-0</td> <td>RHYMES-2</td> </tr> <tr> <td>NBACK5</td> <td>RHYMES-0</td> <td>FACES-2</td> <td>SCENES-0</td> <td>LETTERS-0</td> <td>SCENES-2</td> <td>LETTERS-2</td> <td>RHYMES-2</td> <td>FACES-0</td> </tr> <tr> <td>NBACK6</td> <td>SCENES-0</td> <td>RHYMES-2</td> <td>LETTERS-0</td> <td>FACES-2</td> <td>RHYMES-0</td> <td>FACES-0</td> <td>SCENES-2</td> <td>LETTERS-2</td> </tr> <tr> <td>NBACK7</td> <td>FACES-2</td> <td>LETTERS-2</td> <td>RHYMES-0</td> <td>SCENES-2</td> <td>FACES-0</td> <td>RHYMES-2</td> <td>LETTERS-0</td> <td>SCENES-0</td> </tr> <tr> <td>NBACK8</td> <td>LETTERS-2</td> <td>SCENES-0</td> <td>FACES-0</td> <td>RHYMES-2</td> <td>FACES-2</td> <td>LETTERS-0</td> <td>RHYMES-0</td> <td>SCENES-2</td> </tr> </tbody> </table>		BLOCK1	BLOCK2	BLOCK3	BLOCK4	BLOCK5	BLOCK6	BLOCK7	BLOCK8	NBACK1	RHYMES-2	LETTERS-0	FACES-2	SCENES-0	LETTERS-2	SCENES-2	FACES-0	RHYMES-0	NBACK2	FACES-0	RHYMES-0	SCENES-2	LETTERS-2	RHYMES-2	SCENES-0	FACES-2	LETTERS-0	NBACK3	LETTERS-0	SCENES-2	RHYMES-2	FACES-0	SCENES-0	RHYMES-0	LETTERS-2	FACES-2	NBACK4	SCENES-2	FACES-0	LETTERS-2	RHYMES-0	LETTERS-0	FACES-2	SCENES-0	RHYMES-2	NBACK5	RHYMES-0	FACES-2	SCENES-0	LETTERS-0	SCENES-2	LETTERS-2	RHYMES-2	FACES-0	NBACK6	SCENES-0	RHYMES-2	LETTERS-0	FACES-2	RHYMES-0	FACES-0	SCENES-2	LETTERS-2	NBACK7	FACES-2	LETTERS-2	RHYMES-0	SCENES-2	FACES-0	RHYMES-2	LETTERS-0	SCENES-0	NBACK8	LETTERS-2	SCENES-0	FACES-0	RHYMES-2	FACES-2	LETTERS-0	RHYMES-0	SCENES-2
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Goal	<p>Targeting frontoparietal control network for 2-back vs. 0-back comparison. Targeting category-selective cortex for comparisons between categories.</p>																																																																																	
Other Notes	<p>This NBACK task is an adaptation of the HCP version (Barch et al. 2013 <i>NeuroImage</i>).</p>																																																																																	

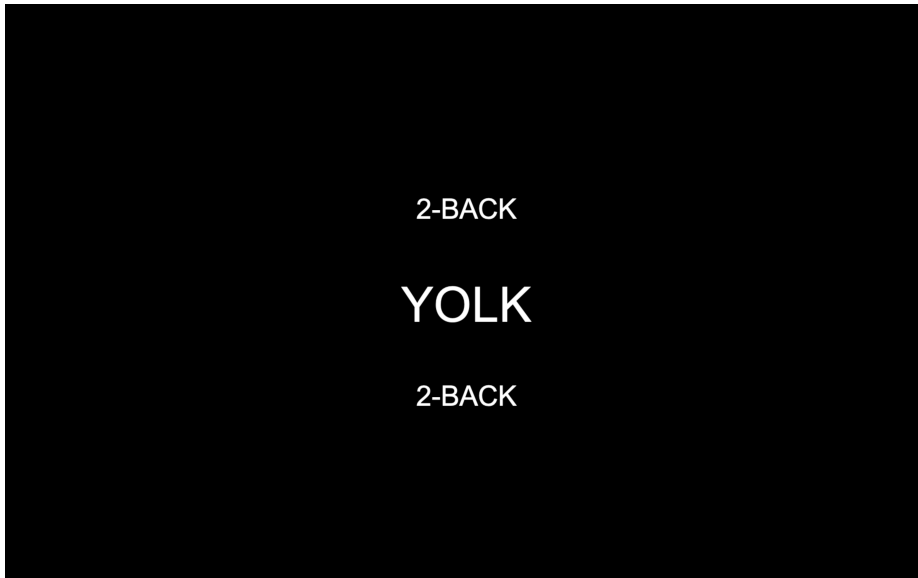
Instruction Screen:



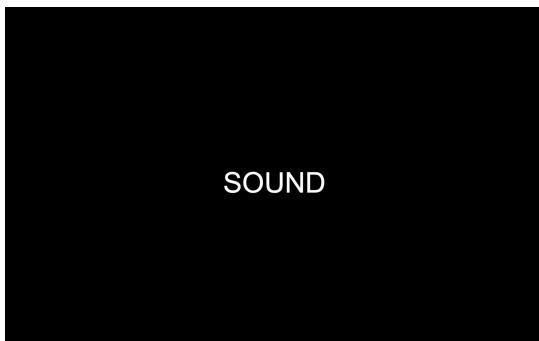
Stay Very Still Screen:



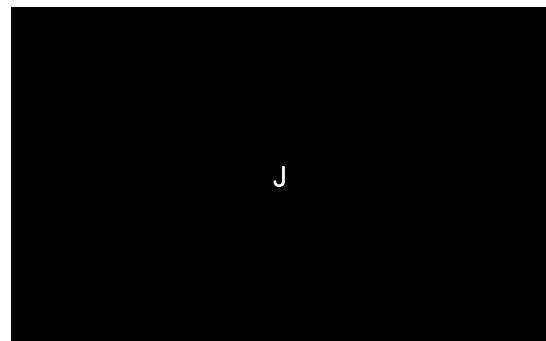
Example Cue:



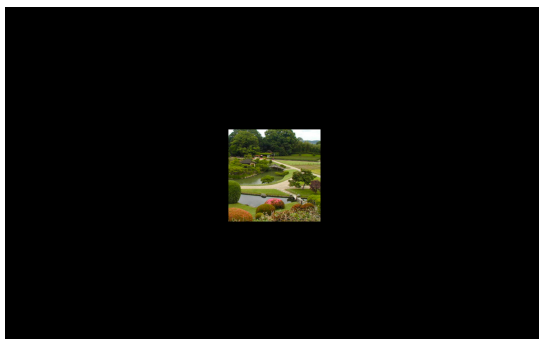
Example RHYME Stimulus:



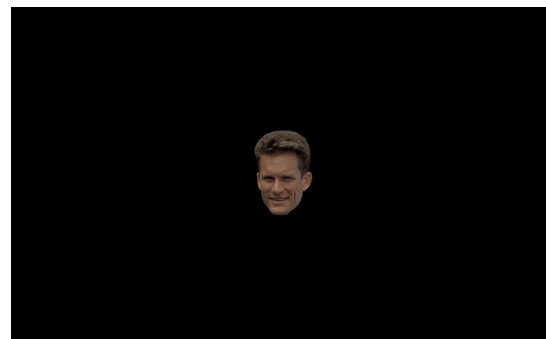
Example LETTER Stimulus:



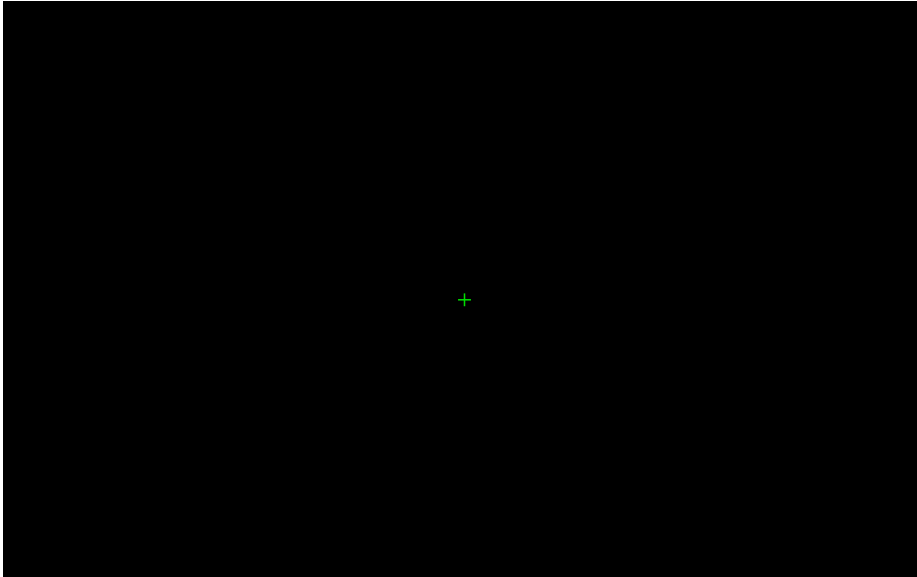
Example SCENE Stimulus:



Example FACE Stimulus:



Fixation Screen (between stimuli within a block):



Fixation Screen (15s fixation periods):

